DESIGN MEMORANDUM NO. 5-06

TO: Chief District Engineers
Design Engineers
Active Consultants

FROM: David Kratt, P.E.
Director
Division of Highway Design

DATE: December 8, 2006

SUBJECT: Omni-Directional Breakaway Support System for Type 1 Posts
Supporting multi-post Sheeting Signs located within the clear zone

Design Memorandum No. 14B-04 states that all projects let to contract after July 1, 2005 shall utilize omni-directional breakaway sign supports, for all new installations of large multi-post signs located within the clear zone, and not protected by crashworthy barriers.

To implement this new Highway Design policy, an entry, for "Type D Breakaway Sign Support Systems for Type 1 Post" has been added to the "List of Approved Materials" maintained by the Division of Materials. This addition outlines the required criteria and the available manufactures that meet this criterion. Further, full size detail sheets have been created to illustrate this sign support system. The full size detail sheet shall be included in the plans and may be obtained from Highway Designs web page at **http://www.kytc.state.ky.us/design/standard2003/Sepia/sepiaJan2003.htm.**

DK: VB:TV

Attachment

TYPE D BREAKAWAY SIGN SUPPORT SYSTEMS FOR TYPE I POST

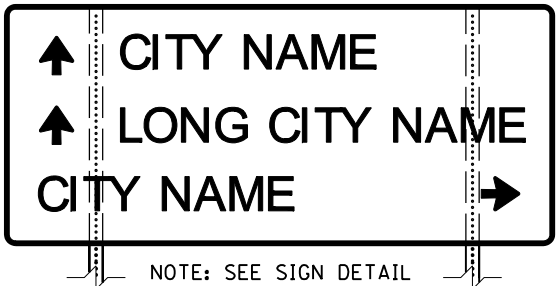
To be placed on this approved list the material supplier or manufacturer must meet the following criteria:

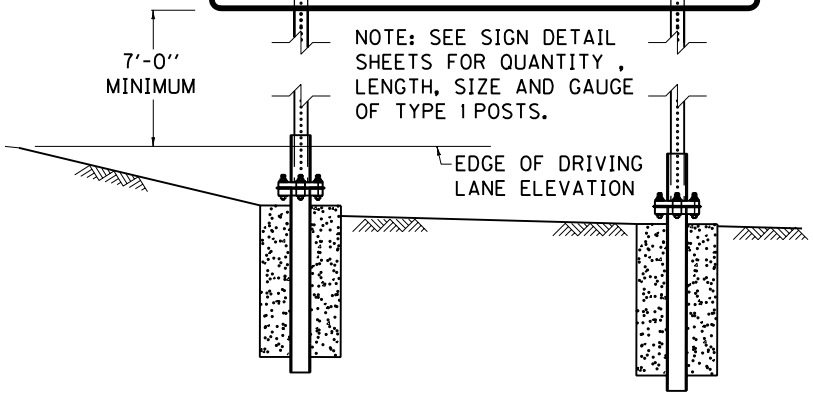
1. Demonstrate Omni-Directional Breakaway Performance and be crash tested at an FHWA certified facility with a minimum of 0, 45, 75, and 90 degree impact angles.
2. Comply with NCHRP Report 350.
3. Comply with the AASHTO 2002 Roadside Design Guide.
4. Comply with the MUTCD
5. Comply with the KYTC Division of Traffic Operations Guidance Manual.
6. Comply with Section 106.04 of the Standard Specifications for Road and Bridge Construction *Buy American Requirement.*
7. Breakaway support hardware must be included on the FHWA list of acceptable, crashworthy supports. (http://safety.fhwa.dot.gov.fourthlevel/pro_res_road_nchrp350.htm)
8. Require no specified torque on the bolts.
9. Perform sufficient structurally to support the beams and signs and to resist ice and wind loads as specified in the 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.
10. The supplier must be able to provide a parts inventory for future maintance.

Contact the Director of Highway Design for information on obtaining approval for your product.

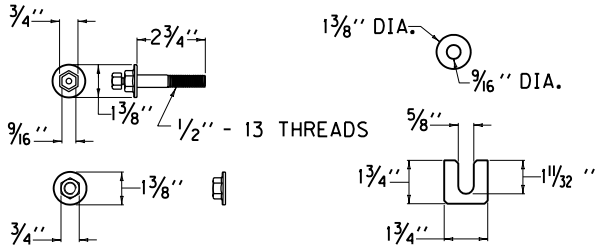
Product Name	**Manufacturer**	**Location**
SB8	Xcessories Squared Development & Manufacturing Inc.	7350 W. State Rt. 104 Auburn, IL 62615 (217) 438-3535 (800) 621-7948

COUNTY OF	ITEM NO.	SHEET NO.

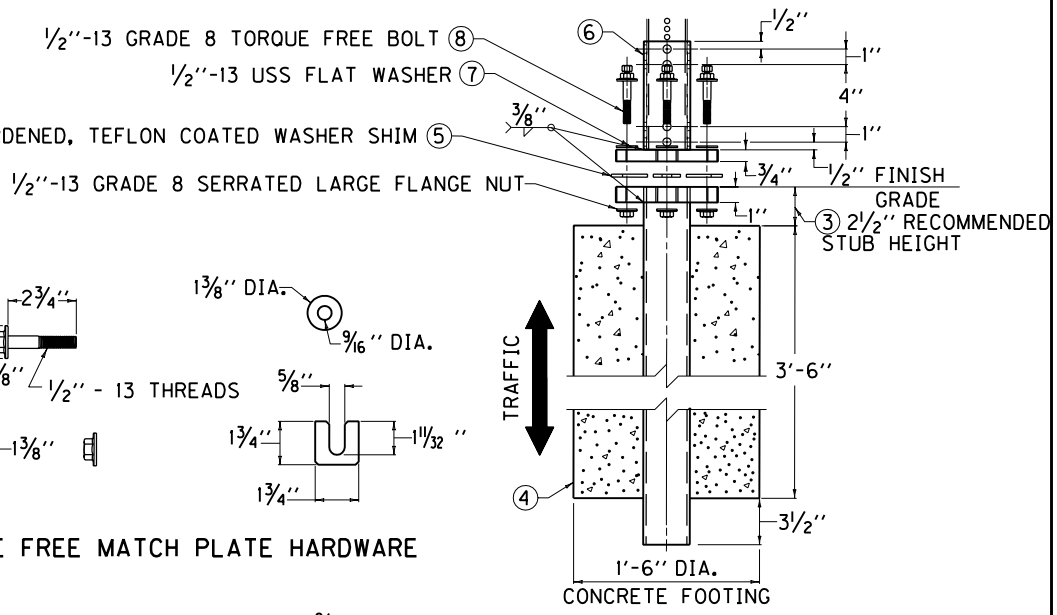




TYPICAL SHEETING SIGN BREAKAWAY SUPPORT INSTALLATION



TORQUE FREE MATCH PLATE HARDWARE



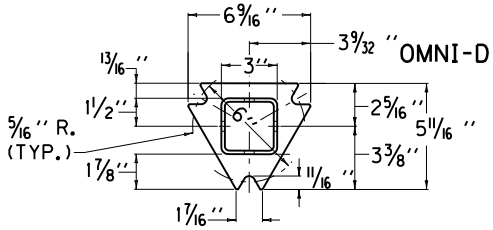
NOTES

1. AUGER AN 18" DIA. HOLE BY 42" DEEP AT THE PREDETERMINED LOCATION.
2. TAP THE BOTTOM OF THE 48" BASE STUB INTO THE SOIL IN THE BOTTOM OF THE HOLE WITH THE BASE PLUMB AND SQUARED UP WITH THE ROADWAY , MAKING SURE THE POINT OF THE PLATE IS FACING ONCOMING TRAFFIC. (THIS SERVES TO STABILIZE THE BASE WHILE POURING THE CONCRETE AS WELL AS TO ALLOW FOR WATER DRAINAGE BELOW THE CONCRETE FOOTING.)
3. DEPTH OF IMBEDMENT TO LEAVE 2 1/2" FROM THE GRADE TO THE TOP OF THE BASE.
4. ALLOW CONCRETE TO SETUP UNTIL HARDENED. (APPROX. 24 HOURS)
5. PLACE 1 EACH TEFLON COATED WASHER SHIM ON EACH OF THE 3 NOTCHED POINTS, WITH THE OPEN SIDE FACING TOWARDS THE CENTER OF THE TRIANGLE.
6. PLACE TOP POST RECIEVER SO THAT THE SIGN POST IS IN CORRECT POSITION FOR SIGN VISIBILITY, ON TO THE BASE AND WASHER SHIMS.
7. PLACE 1 EACH 1/2" WASHER ONTO TORQUE FREE BOLT AND PLACE IN EACH NOTCHED POINT OF THE TRIANGLE. PUSH EACH TEFLON COATED WASHER SHIM AGAINST THE SHANK OF EACH BOLT AND FINGER TIGHTEN 1/2" FLANGED LOCK NUT.
8. FULLY TIGHTEN , THEN LOOSEN , ALL THREE TORQUE FREE BOLTS USING THE LARGER 3/4" HEX HEAD. COMPLETE BY TIGHTENING EACH BOLT USING THE SMALLER 9/16" HEX HEAD UNTIL IT TWIST OFF.

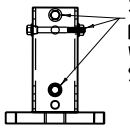
   NOTE : SECONDARY HEAD WILL TWIST OFF AT DESIRED TORQUE LEVEL TO MEET FEDERAL COMPLIANCE.
9. INSERT SIGN SUPPORT INTO THE TUBULAR PORTION OF THE TOP POST RECIEVER AND SECURE WITH 3 EACH 3/8"- 16 x 3 1/2" GRADE 8 FLANGED SHOULDER BOLTS AND FLANGED NUTS.

   NOTE: WHERE HIGHER WINDLOAD IS DESIRED, INSERT THE NEXT SIZE SMALLER SQUARE POST INSIDE BOTTOM OF MAIN UPRIGHT POST.

   NOTE: ON MULTI-LEG INSTALLATIONS, BE SURE THAT ALL ANCHORS ARE SQUARED AND LINED UP WITH EACH OTHER.
10. TYPE D BREAKAWAY SIGN SUPPORT SYSTEMS FOR THE TYPE I POSTS SHALL BE SELECTED FROM THE KENTUCKY DEPARTMENT OF HIGHWAYS APPROVED MATERIALS LIST. OR AN APPROVED EQUAL. ACCEPTABLE ALTERNATES SHALL BE APPROVED BY THE DIVISION OF HIGHWAY DESIGN AND FHWA , PRIOR TO INSTALLATION.



TYPE "D" SUPPORT
OMNI-DIRECTIONAL BREAK-A-WAY
FOR TYPE I POSTS

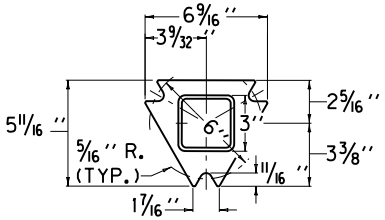


3/8" - 16 x 3 1/2" GRADE 8 FLANGED SHOULDER BOLT WITH 3/8"-16 GRADE 8 SER. FLANGE NUT (9)

MATERIALS: TUBE RECEIVER - 3" x 3" x 7 GA. ASTM A500
ASTM A500 GRADE B TUBE PLATE - ASTM A572 GRADE 50

TOP POST RECEIVER / FOR 2 1/2" SQUARE POST

2 1/4" x 12 GA. MAYBE INSERTED INTO
2 1/2" X 12 GA. FOR ADDITIONAL WINDLOAD



BOTTOM BASE CONCRETE STUB (2)

MATERIALS : TUBE - 3"X 3" X 7 GA. ASTM A500
GRADE B TUBE PLATE - ASTM A572 GRADE 50

KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPE D BREAKAWAY
SIGN SUPPORT

SUBMITTED _____ 12-07-06
TEAM DIVISION OF HIGHWAY DESIGN — DATE

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